

## Towards Standard Measures in Health Assessments

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**\*\*\* Note: Figures may be missing from this format of the document**

### **Article:**

A key component in the design, implementation, and evaluation of health education and health promotion programs is the measurement of health characteristics and practices. These measures can be used as baseline data points and subsequently as a means by which to assess changes across time and compare results from study to study. A major concern for all health promotion professionals is the use of consistent measures across various studies. To this end, this edition of Research Notes provides some standard and recommended measures to use when assessing health characteristics and practices.

The measures selected are those perceived by the authors to be most frequently used in health education and promotion research. Standard measures are defined as those that have been established by official agencies of the Federal government. Recommended standards are those advanced by the authors based on citations from the professional literature. These are offered as suggested measures.

<b>TABLE 1</b>	
Risk Level for Systolic and Diastolic Blood Pressure	
<b>Diastolic</b>	
< 85	Normal Blood Pressure
85 - 89	High Normal Blood Pressure*
90 - 104	Mild Hypertension**
105 - 114	Moderate Hypertension
≥ 115	Severe Hypertension
<b>Systolic (When Diastolic Blood Pressure is &lt;90)</b>	
< 140	Normal
140 - 159	Boderline Isolated Systolic Hypertension
≥ 160	Isolated Systolic Hypertension
* Requires Monitoring	
** Requires Medical Attention	

### **Standard Measures**

#### ***Blood Pressure***

Standards for blood pressure have been established by the National Heart, Lung, and Blood Institute.' The level established for elevated blood pressure has been established at >140 mm/hg for systolic blood pressure and > 90 mm/hg for diastolic blood pressure. The risk of cardiovascular complications related to hypertension increases continuously with increasing levels of systolic and diastolic blood pressure. The following table of classification provides standards for adults 18 and older for systolic and diastolic blood pressure.

## Cholesterol

Measures of blood serum cholesterol are also provided by the National Heart Lung, and Blood Institute.<sup>2</sup> These measures are provided for total cholesterol, LDL, and total cholesterol/ HDL ratio. Table 2 provides these measures.

## Recommended Measures

Recommended measures are based on a review of literature and on the subjective opinion of the authors with regard to how these measures should be recorded by health promotion professionals.

TABLE 2	
Risk Levels for Cholesterol	
<b>Total Cholesterol</b>	
< 200 mg/dl	Desirable blood cholesterol
200-239	Borderline high blood cholesterol
240 +	High blood cholesterol
<b>LDL Cholesterol</b>	
< 160 mg/dl	High LDL cholesterol
<b>Total Cholesterol/HDL Ratio</b>	
≤ 4	Acceptance
4.1 to 5.0	Borderline high blood cholesterol
>5.0	High blood cholesterol

## Percent Body Fat

The guidelines for assessing levels of body fat are cited from an article appearing in Patient Care.<sup>3</sup> These guidelines were developed by the Department of Family Practice at the University of Iowa College of Medicine. Table 3 provides these guidelines.

TABLE 3		
Guidelines for Recording Percent Body Fat		
Body Fat Level Ratings	Men	Women
Very Low	7-10%	14-17%
Low	10- 13%	17-20%
Average	13-17%	20-24%
Above Normal	17-20%	24-27%
Very High	20-25%	27-30%
Obese	> 25%	> 30%
These ratings are based on the assumption that percent body fat readings are properly measured. Of course, there are individual exceptions to these guidelines. For example, normal body measures for male athletes are between 4 and 12%, with an absolute minimum of 3%. For female athletes, norms are between 13 and 20%, with an absolute minimum of 10%.		

TABLE 4			
Body Mass Index Categories by Age			
Age	Underweight	Desirable	Overweight
19-24	≤18	19-24	≥25
25-34	≤19	20-25	≥26
35-44	≤20	21-26	≥27
45-54	≤21	22-27	≥28
55-65	≤22	23-28	≥29
≥ 66	≤23	24-29	≥30

## Overweight and Obesity

The quantification of normal weight and an overweight range can be accurately made only on the basis of adipose-tissue assessment. Unfortunately, none of the percent body fat methods (i.e., skinfold thickness, hydrostatic weighing, and bioimpedance measurement) have shown clinically practical when testing a large group of subjects. Consequently, the computation of a body mass index (BMI) has gained favor as a technique for combining height and weight into a single index of relative obesity. BMI is defined as the weight (in kg) divided by height squared (in meters) (wt/ht<sup>2</sup>). Although the use of BMI to define obesity is subject to overt

error in some individuals, in population groups the obesity defined by 131v11 measurement agrees remarkably well with other body fatness assessments (skinfold thickness, hydrostatic weighing). In addition, a number of studies have shown the relationship between the BMI and disease and between the BMI and mortality.<sup>4-5</sup> Table 4 is a categorization of the BMI.

### *Drinking Levels*

The majority of studies on alcohol abuse and prevention have examined the drinking level of individuals. Some studies ask respondents to indicate their drinking frequencies whereas others require respondents to indicate both their drinking frequencies and the amount consumed. Researchers, often relying on their experience and/or the sample distribution, assign subjects to heavy, moderate, light, and abstainer groups.

Because of the inconsistent criteria used for defining drinking levels, it is often difficult to compare findings from study to study. The National Mortality Followback Survey used three questions concerning alcohol to categorize drinking levels:

1. In the person's entire life, did he or she have at least 12 drinks of any kind of alcoholic beverage, such as beer, wine, or liquor?
  - A. Yes
  - B. No
  
2. On the average, during adult life, how often did he or she drink any alcoholic beverages, such as beer, wine, or liquor?
  - A. Every day
  - B. 3 to 6 times a week
  - C. 1 or 2 times a week
  - D. 1 to 3 times a month
  - E. Less than once a month
  - F. Unknown
  
3. On the days that the person drank, how many drinks did he or she have on the average, per day?
  - A. 12 or more
  - B. 7 to 11
  - C. 5 or 6
  - D. 3 to 4
  - E. 2
  - F. 1
  - G. Unknown

If respondents answered, "Yes" to Question 1, then their drinking levels are quantified on the basis of combinations of the responses in Questions 2 and 3 (see Table 5).

### *Smoking*

Levels of smoking behavior have been categorized with varying levels of sophistication and detail. Consequently, it was difficult to select a universally accepted measure for smoking behavior. The authors believe that the classification used on the "Healthier People Health Risk Appraisal" developed by the Carter Center of Emory University<sup>6</sup> provides valid guidelines for assessing smoking behavior. Their measurement consists of three questions:

#### 1. Cigarette Smoking

How would you describe your cigarette smoking habit?

- A. Never Smoked (Skip questions 2 and 3 if A)

- c. Still Smoke (Answer question 2 if C)

How many cigarettes a day do you smoke?

\_\_\_\_\_ Cigarettes per day

A. How many years has it been since you smoked cigarettes fairly regularly?

Years

- B. What was the average number of cigarettes per day you smoked in the 2 years previous to your quitting?

Cigarettes per day \_\_\_\_\_

### *Physical Activity*

Physical fitness programs often measure participation in terms of self-report of how frequently individuals have visited the fitness center or attended a fitness class. This type of assessment often does not adequately measure individual levels of physical education. Although measurements of oxygen uptake ( $\text{VO}_2^{\text{Max}}$ ) is an effective way to monitor improvement in physical fitness across time, this procedure is time consuming and expensive. Consequently, health educators often search for ways to categorize levels of physical activity. Figure 1 is a modification of the work of Simon-Morton.<sup>7</sup> It also is suggested as a means of recording levels of physical activity in the CDC publication titled "Promoting Physical Activity Among Adults."<sup>8</sup>

Quantify of Drinking (Question 3)	Frequency of Drinking (Question 2)					
	(A) Everyday	(B) 3-6/wk	(C) 1-2/wk	(D) 1-3/mo	(E) <1/mo	(F) Unknown
(A) 12 or more	H	H	H	M	L	L
(B) 7 to 11	H	H	M	M	L	L
(C) 5 to 6	H	H	M	L	L	L
(D) 3 to 4	H	H	M	L	L	L
(E) 2	H	M	L	L	L	L
(F) 1	M	M	L	L	A	A
(G) Unknown	M	M	L	L	A	U

Note: H = Heavy, M = Moderate, L = Light, A = Abstainer, U = Unknown (missing)

<p align="center"><b>FIGURE 1</b></p> <p align="center">A person determines what level he/she is currently at and then selects the next level.</p>		
Physical Activity	Activity Description	Activity Examples
<p align="center"><b>Level 1</b></p> <p align="center"><b>"Sedentary"</b></p>	Essentially no physical activity above minimum demands of daily living.	<ul style="list-style-type: none"> <li>• Watching TV</li> <li>• Working at desk</li> <li>• Riding in Car</li> <li>• Eating</li> </ul>
<p align="center"><b>Level 2</b></p> <p align="center"><b>"Minimally Active"</b></p>	Activity during normal daily routine to limber body and provide light muscle contraction <ul style="list-style-type: none"> <li>• Total of 15 to 30 minutes per day</li> <li>• Daily</li> <li>• Very light to fairly light perceived exertion</li> </ul>	<ul style="list-style-type: none"> <li>• Walking</li> <li>• Occasional stair climbing</li> <li>• Light gardening</li> <li>• Light home repairs</li> </ul>
<p align="center"><b>Level 3</b></p> <p align="center"><b>"Mildly Active"</b></p>	Activity to limber body and provide moderate muscle contraction to large muscle groups <ul style="list-style-type: none"> <li>• Total 30 to 60 minutes per day</li> <li>• Daily</li> <li>• Fairly light to somewhat hard perceived exertion</li> </ul>	<ul style="list-style-type: none"> <li>• Walking</li> <li>• Calisthenics</li> <li>• Heavy gardening</li> <li>• Major home repairs</li> </ul>
<p align="center"><b>Level 4</b></p> <p align="center"><b>"Moderately Active"</b></p>	1 or more dynamic activities with large muscle groups. <ul style="list-style-type: none"> <li>• 15 minutes or more per session</li> <li>• 1 to 3 sessions per week</li> <li>• Exercise maintains heart rate in target zone</li> </ul>	<ul style="list-style-type: none"> <li>• Running/jogging</li> <li>• Lap swimming</li> <li>• Bicycling</li> <li>• Fast walking</li> <li>• Calisthenics/dancing</li> <li>• Aerobic classes</li> <li>• Stairclimbing/Stairclimer</li> <li>• Nonaerobic sports**</li> </ul>
<p align="center"><b>Level 5</b></p> <p align="center"><b>"Vigorously Active"</b></p>	1 or more dynamic activities with large muscle groups. <ul style="list-style-type: none"> <li>• 20 minutes or more per session</li> <li>• 3 or more sessions per week</li> <li>• 65% or greater maximal heart rate or somewhat hard to hard perceived exertion</li> </ul>	Same Exercises As In Level 4 Including: <ul style="list-style-type: none"> <li>• Bench Classes</li> <li>• Aerobic sports*</li> </ul>
<p align="center"><b>Level 6</b></p> <p align="center"><b>"Very Vigorous"</b></p>	1 or more dynamic activities with large muscle groups. <ul style="list-style-type: none"> <li>• 30 minutes or more per session</li> <li>• 4 or more sessions per week</li> <li>• 65% or greater maximal heart rate or somewhat hard to hard perceived exertion</li> </ul>	Same Exercises As In Levels 4 and 5 Including: <ul style="list-style-type: none"> <li>• Cross-Training</li> <li>• Fitness activities</li> <li>• Bench class and Running</li> <li>• Lapswimming and Bicycling</li> </ul>
<p align="center"><b>Level 7</b></p> <p align="center"><b>"Competitive"</b></p>	1 or more dynamic activities with large muscle groups. <ul style="list-style-type: none"> <li>• 40-60 minutes per session</li> <li>• 5-6 sessions per week</li> <li>• 65% or greater maximal heart rate or somewhat hard to hard perceived exertion</li> </ul>	Same Exercises In Level 4 Through 6 Including: <ul style="list-style-type: none"> <li>• Competitive Athletic Training</li> </ul> Examples: <ul style="list-style-type: none"> <li>• Triathlon training</li> <li>• 10-K training</li> <li>• Marathon training</li> </ul>
*e.g., roller skating, cross-country skiing, soccer **e.g., tennis, basketball, baseball, downhill skiing		

### Safety Belts

Some studies examining safety belt use have asked the respondents, "Do you wear a safety belt?" with the response choices "Yes" or "No." Such information could be misleading. In one of our recent health risk appraisal studies, we examined the safety belt use of a group of randomly selected employees (n = 673) in a large company. Employees were asked, "What percent of the time do you usually buckle your safety belt when driving or riding?" We found that only 3.3% indicated they used safety belts 0% of time, and 53.3% used them 100% of the time, while 43.4% used various percents of time from 1 to 99. If they were given "Yes" or "No"



choices, about 96.7% of the subjects would probably say "Yes," which may disguise the safety belt use problem. We believe that an appropriate response would be to have subjects indicate the percent of time that they used safety belts. The data then can be used as a continuous variable or be categorized as:

All the time (100%)

Most of the time (80-99%)

Sometimes (20-79%)

Rarely (1-19%)

Never (0%)

Even though the relationship between the percent of safety belt use categories and the health risk scores has yet to be established, the percent of safety belt use would provide investigators better information.

### **Closing Remarks**

The measures cited in this article serve as suggestions. Clearly, more research and thought are needed before standard measures are agreed upon by all health educators. Yet establishing such standardization would allow health education and health promotion professionals to compare more accurately the results of various studies.

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